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TOOTHPASTE COMPOSITION  
[COMPOSITION DE PATE DENTIFRICE]  
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## TOOTHPASTE COMPOSITION

### Abstract

A toothpaste composition that is rich in mineral substances that are suitable for preserving and enhancing oral hygiene.

This toothpaste composition is prepared by homogeneous mixing of a traditional toothpaste composition, which includes a polishing agent, a wetting agent, a bonding agent, a softening agent, a sweetening agent, some preservatives, an effectiveness enhancing agent and an aromatic compound, with a granular serion composite baked at high temperature, essentially comprised of 15-25% sericite, 30-60% halloysite, 20-30% muscovite, 5-10% actinolite and 10-20% talc, in which the percentage (%) is based on the weight of the toothpaste composition. This serion composite has a grain size greater than 280 mesh (so that it is capable of passing through a 51.5 micrometer mesh opening sieve, and is baked in a reduction operation at temperatures of 300-350°C.

The present invention pertains, in a general way, to a toothpaste composition that is rich in mineral substances that are suitable for preserving and enhancing oral hygiene.

Several kinds of toothpastes have been put on the market which are typically used before and after meals applied by a

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<sup>1</sup> Numbers in the margin indicate pagination in the foreign text.

toothbrush. In addition, the toothpaste composition has been mixed with some aromatic compounds, agents that protect the skin and agents that strengthen the frictional force of the teeth in order to improve its effectiveness for preserving and enhancing oral hygiene.

One goal of the present invention is to propose a new toothpaste composition, prepared by mixing a traditional toothpaste composition with an alimentary mineral composite, obtained by serial treatment of a mineral mixture that is rich in several mineral substances that include a selenium base.

In order to achieve the above goal of the present invention, a mineral mixture, which includes sericite, halloysite, muscovite, actinolite and talc, in a mixture of them in individually predetermined contents, is subjected to crushing, removal of iron, and a baking process at high temperature in order to prepare a mineral composite (designated in the following text as being "the serion composite"). This serion composite that is produced is then added to a traditional toothpaste composition. This toothpaste composition includes polishing agents, wetting agents, bonding agents, frothing agents, sweeteners, preservatives, effectiveness enhancing agents and aromatic compounds, which thus result in a new toothpaste composition that is suitable for preserving and enhancing

protection of oral mucous membrane as well as hygiene of the teeth. /2

Polishing agents are chosen from the group comprised of calcium hydrogen phosphate, precipitated silicon dioxide, silica gel, calcium carbonate, hydrated aluminum, insoluble sodium metaphosphate, calcium pyrophosphate, zirconium silicate, hydroxyl apatite and a mixture of the latter. The content of polishing agents will depend on the polishing capacity, the application tool and the effectiveness of the resulting toothpaste composition, and such agents are added to the toothpaste composition in a quantity of 1-90% by weight, preferably from 1-50% by weight.

The wetting agents used to prevent the resulting toothpaste composition from solidifying when this resulting compound is exposed to the atmosphere, are chosen from among polyhydric alcohols, such as a solution of sorbitol (70% strength), glycerol (TG), polyethylene glycol (PEG) and propylene glycol (PG), and mixtures of the latter. These wetting agents are added to the toothpaste composition in a quantity from 10-70% by weight.

The bonding agents that are used to bond the solid to the liquid and to prevent their separation are chosen from among the group comprised of carboxy methyl cellulose (CMC), the calcium or sodium salt of carrageenan, the resin poly (vinyl acrylate) that is soluble in water, polyvinyl pyrrolidone, gums, aluminum

silicate, magnesium silicate and mixtures of the latter. These bonding agents are added to the toothpaste composition in a quantity of 0.1-3.0% by weight.

The frothing agents, which are used to enhance the cleaning effect of the resulting toothpaste composition by decreasing the surface tension of the resulting toothpaste, are chosen from among the group comprised of an anionic surface active agent, such as sodium alkyl sulfate and the monoxide of sodium lauryl sarcolate; one of the polymer compounds of the polyoxyethylene and polyoxypropylene group; and a non-ionic surface active agent such as polyoxyethylenated hardened castor oil, ester compounds of fatty acids of polyoxyethylenated condensed sorbitan, /3 sorbitan and sucrose. This frothing agent is added to the toothpaste composition in a quantity of 0.1-5% by weight and, preferably, with a surface tension that is in a range extending from 40 to 50 dynes/cm<sup>2</sup>.

The sweetening agents are chosen from among non-fermentable saccharides, synthetic or natural, such as sodium saccharate, aspartame, stebiocide, acetosulfamide, licorice acid, the ammonium salt and potassium salt of licorice acid, the isomerized saccharide and solutions of sorbitol. These sweetening agents are added to the toothpaste composition in a quantity of 0.01-0.5% by weight.

The aromatic compounds are prepared with the addition of anise, methyl salicylate, acids of lemon, eucalyptol, cinnamic aldehyde, with a main ingredient such as the essence of peppered mint, the essence of green mint, menthol and the essence of garden balm. These compounds are added to the toothpaste composition in a quantity of 0.05-1.5% by weight.

In addition, the toothpaste composition before being mixed with the serion composite has 0.01-0.5% by weight of preservatives for foods and medications added to it, such as the ester of para-hydroxy benzoic acid, benzoic acid, sodium benzoate and salicylic acid.

In the following text, we will describe the process for preparation of the serion composite before being mixed with the traditional toothpaste composition in conformity with the present invention.

#### 1. Crushing

The raw minerals of sericite, halloysite, muscovite, actinolite and talc are prepared and completely dried. Here the preparation of the minerals is carried out in order to eliminate mechanically foreign substances from the minerals. The prepared minerals are then subjected to crushing at high speed with the 1/4 use of a traditional crushing unit, such as a friction cylinder type crushing unit or a rotary type crushing unit, which thus furnish a granular mineral mixture having, in a general way, a

grain size greater than 280 mesh (so that it is capable of passing through a 51.5 micrometer mesh opening sieve).

## 2. Removal of iron

Crushing of minerals is followed by removal of iron from the mineral mixture. In order to remove the iron the mineral mixture, the granular mixture that results, after being placed on a rotary cylinder or a band conveyor, is subjected to a powerful magnetic force line. This magnetic force line is transmitted across the mineral mixture at the same time that it is eliminating the iron from the mixture. In addition, the granular mineral mixture is stirred with an electromagnet to completely eliminate the remaining iron from the mixture.

## 3. Concentration

### (1) Dry concentration

The small granular minerals of more than 280 mesh (having a grain size so that they are capable of passing through a 51.5 micrometer mesh opening sieve) are concentrated by using a concentration net, under conditions such that they are made to fly in the air that is inflated at a speed allowing them to be made to fly.

### (2) Concentration in water

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The granular minerals are made to float on 10-20 times their volume of water, and only the small granular minerals that float on the surface of the water are concentrated.

It is apparent that the concentration of small granular minerals can be accomplished by using both dry concentration and concentration in water simultaneously.

#### 4. Mixing

The minerals, that is 15-25% of sericite, 30-60% halloysite, 20-30% muscovite, 5-10% actinolite and 10-20% talc, the set percentages (%) being based on the weight of the toothpaste composition, are mixed uniformly with one another by using a traditional mixing machine.

#### 5. Baking

The resulting mineral mixture is subsequently added to a reduction baking oven, with the oven closed, at a temperature of 350°C, and remains there for at least 30 minutes.

The resulting granular serion composite is in turn cooled to a predetermined temperature and mixed with the aforementioned toothpaste composition in a quantity of 20-80% by weight of the toothpaste composition. The efficacy of the resultant toothpaste composition is proportional to the ratio of the serion composite mixture to the toothpaste composition. When more than 80% by weight of the serion composite is added to the toothpaste composition, the aptitude for mixing of the toothpaste composition with other components is decreased. Such a reduction of the aptitude for mixing reduces noticeably the viscosity of /6 the resulting toothpaste composition to such an extent that this

toothpaste can scarcely be used. In this regard, the mixing quantity of the serion composite in relation to the toothpaste composition is limited to about 80% by weight at maximum. In addition, a mixing quantity of the serion composite of less than 20% by weight causes a noticeable reduction of the efficacy of the resulting toothpaste composition. For this reason, the minimum mixing quantity of the serion composite is limited to about 20% by weight.

Among the ingredients of the serion composite mentioned earlier, actinolite, halloysite and muscovite have been used as effective Chinese medications. Describing them in detail, actinolite that has several colors such as milky white, bluish white, bluish grey and yellowish brown reveals efficacy against sexual depression, frigidity, irregularity of menstruation, back pain and pain in the knees. Halloycite is effective against chronic diarrhea, intestinal hemorrhaging, dyspepsia, peptic ulcer, duodenal ulcer, vomiting and external sores. Muscovite is effective against dyspepsia, enteritis, diarrhea, bleeding that accompanies an external wound and furuncle virus.

Moreover, it has been reported that selenium of sericite has an excellent effectiveness. In particular, a high concentration of selenium has excellent effectiveness against cancers, as reported by Nelson et al. in 1943, Clock and Handric in 1954, Bolgarev and Chercas in 1967, Schroder and Migener in 1971,

Gardener in 1973 and Van Hawelling in 1979 for example. Dr. Richard A. Paswater describes, in his article "Selenium as a food medication", published by Kids Publishing Company, New Canaan, Connecticut, USA, that the aforementioned effectiveness of selenium against cancers is due to its intrinsic function as a /7 stimulus of immune reactions, protection vis-à-vis peroxide, for maintaining cytochrome respiration, protection of the liver, improvement of harmlessness of substances that induce mutation in cancer, reinforcement of the heart muscle, reduction of intravascular fibrin and production of oxygen. In particular M. D. Klaus Schwarz has reported that the protection of the membranes by selenium leads to effectiveness of the latter for reinforcement of immunocompetence and protection vis-à-vis aging. In addition, it has been reported that selenium improves the cytochrome function of the mitochondria and enhances elimination of cadmium by taking part directly in the production of a prostaglandin type hormone pseudo material.

In recent time, the soil in the suburbs of heavily polluted towns, in particular those polluted by large quantities of chemical products used for agriculture and synthetic fertilizers, inevitably becomes acidified, and the latter leads to the expulsion of several elements such as Ti, Mn, Co, Fe, Al, Mg, Ca and Se, from the ground. In this respect, such an acid soil will see a reduction in its content of essential minerals up to a

measurement of less than 1/100-1/1000 of normal soil. Thus, it is necessary to introduce additionally some mineral substances into the human body, and the present invention adds this additional supply of mineral substances. The mineral ingredients of the present toothpaste composition operate on the surface of the teeth cement, as well as on the oral mucous membrane during brushing of the teeth, thus providing and caring for paralysis and dental caries, bad breath and cancer of the mouth.

The following table presents five examples and one comparative example that are simply intended to illustrate the present invention in more detail and should not in any way be considered as limiting of the scope of protection of the invention.

TABLE

Substances	Ex. 1	Ex. 2	Ex. 3	Ex. 4	Ex. 5	Comparative Example
Glycerol	10.0	10.0	-	-	-	10.0
Sorbitol solution	20.0	20.0	60.0	55.0	60.0	20.0
PEG	-	-	5.0	5.0	5.0	-
CMC-Na	1.5	1.5	1.0	1.0	1.0	1.5
Sodium Saccharinate	0.2	0.2	0.2	0.2	0.2	0.2
Paraoxymethylbenzoic acid	0.1	0.1	-	-	-	0.1
Paraoxypropylbenzoic acid	0.05	0.05	-	-	-	0.05
Benzoic acid	-	-	0.1	0.1	0.1	-
Primary fluorophosphate of sodium						
Sodium fluoride	0.10	0.10	0.22	0.10	0.10	0.10
Calcium glycerophosphate	-	-	-	-	0.13	-
Didydrate*	-	48.0	-	-	-	-
CaCO <sub>3</sub>	42.0	-	-	-	-	40.0
Silicon dioxide gel	-	-	-	-	6.0	-
Silicon dioxide sediment	-	-	25.0	20.0	18.0	-
Coloring agent	-	-	-	0.005	-	-
Turbidity agent	-	-	0.3	0.3	0.3	0.3
Sodium laurel sulfate	2.0	2.0	2.0	2.0	2.0	2.0
Perfume	1.0	1.0	1.0	1.0	1.0	1.0
Water						
Serion composite**	0.0	25.0	30.0	50.0	60.0	-

\*: dihydrated calcium hydrogen phosphate

\*\* : serion composite of the present invention added to the other ingredients in percentage with respect to the total weight of the ingredients.

### MEASUREMENT

As the result of the practical use of the toothpaste composition in conformity with examples 1-5 of the present invention and in the comparative example, we have noted that the toothpaste compositions in conformity with the present invention

will yield, during brushing of the teeth, occasional epidermal bleeding (less than 1-2%), while the toothpaste composition of the comparative example would result in epidermal bleeding (about 10%). In addition, the effectiveness of prevention of epidermal bleeding was proportional to the serion composite content. In particular, the toothpaste compositions of the present invention have demonstrated, by comparison with that of the comparative example, an excellent preventive effect of bad breath, relief for dental paralysis and reduction of the duration of treatment of oral inflammation.

The present invention has been described in detail with particular reference to preferred modes of implementation of the latter; however, it should be understood that variants and modifications could be made within the spirit and area of protection of the invention.

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#### CLAIMS

1. Toothpaste composition which includes a dental composition that includes a polishing agent, a wetting agent, a bonding agent, a frothing agent, a sweetening agent, preservatives, an efficacy enhancing agent and an aromatic compound, characterized by the fact that the said toothpaste composition has been mixed uniformly with a granular serion composite baked at high temperature, essentially comprised of 15-25% of sericite, 30-60%

halloysite, 20-30% muscovite, 5-10% actinolite and 10-20% talc, the said percentages being based on the weight of the toothpaste composition.

2. Toothpaste composition according to claim 1 characterized by the fact that the said serion composite has a grain size greater than 280 mesh (so that it is capable of passing through a 51.5 micrometer mesh opening sieve) and is baked in a reduction oven at temperatures of 300-350°C.